19) **FEDERAL REPUBLIC OF GERMANY**

[EMBLEM]

GERMAN PATENT AND TRADEMARK OFFICE

12) **Published Patent Application**

10) **DE 198 10 818 A 1**

21) Application number: 198 10 818.4
22) Application date: 03/12/98
43) Publication date: 09/16/99

51) Int. Class.[6]:
F 24 C 15/20

71) Applicant:
Eisfink Carl Fink GmbH & Co, 71636 Ludwigsburg, DE

74) Patent Attorneys:
Ackmann, Menges & Demski Patent Attorneys, 80469 Munich

72) Inventor:
Friedhelm Frank, 76227 Karlsruhe, DE

The following information has been extracted from documents submitted by the applicant.

54) Vapor exhaust hood

57) Described is a vapor exhaust hood (1) with a subordinated combination ventilator and filtering system (12). The vapor exhaust hood (1) is designed to be height-adjustable in such a way that it can be positioned over any desired cooking site (10) of a cooking center (2), cooking range or of such similar at a low height. The vapor exhaust hood (1), which is adjustable in its size to match the size of the cooking site (10), can be brought into position directly over a cooking site (10). This allows for directly suctioning off the cooking vapors at their site of origin and for purifying them in the ventilator and filtering system (12) subordinated to the vapor exhaust hood (1) and subsequently channeling the air out into the surroundings.

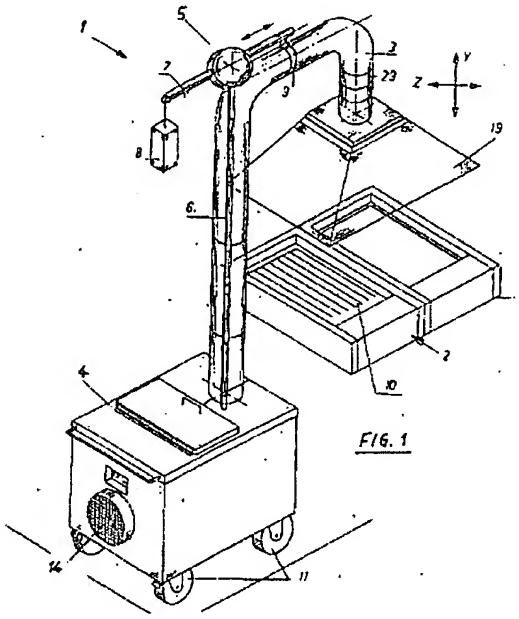


FIG. 1

Description

The invention concerns a vapor exhaust hood of the type indicated in the precharacterizing clause of patent claim 1.

Such vapor exhaust hoods are know for their application in kitchens or in business cafeterias in which the persons partaking in the meals serve themselves with warm foods, beverages, salads etc. at different stations. Such business cafeterias are designated as free flow cafeterias and are normally equipped with conveying or moving stations. As a result, the stations can be configured in a very flexible manner and the delivered meals can be varied to please the consumer and the cafeteria operator is pleased about saving in terms of hired personnel.

In such a configuration of stations, a cooking center presents a decisively appealing feature for common use in the on-site preparation of meals. Normally, the cooking center is comprised of several cooking stations. When the cooking staff is preparing a dish such as roast, meat, fish or such similar, the cooking vapors generated in the cooking center must absolutely be evacuated by an exhaust.

To this end and according to the current state of the art, vapor exhaust hoods are used, of which an example is known in the German utility model nr 295 11 237 originating from this patent applicant. A ventilator and filtering system is configured in the known vapor exhaust hood. The vapor exhaust hood can either be secured directly over the entire cooking center or can be placed over the cooking center by means of a support structure with legs. In any case, the vapor exhaust hood covers the entire area of the cooking center. The cooking vapors are purified by the filtering system to eliminate not only fat fumes, but aromatic substances, aerosols and other organic particles as well so that the exhausted air can be rereleased into the very same room in which the vapor exhaust hood and the cooking center are located and therefore serve as ambient circulating air. Such an ambient circulating air vapor exhaust hood can therefore be used at any site in a business cafeteria or in a kitchen since no exhaust air duct or flue is required.

Since cooking centers can be relatively large, as previously mentioned, the vapor exhaust hood must also be correspondingly large so that it can be positioned over the entire cooking center area and thus cover same said area in its entirety. To avoid limiting the working space of a user or of the chef in the cooking center, the vapor exhaust hood is generally placed at a height of 2.10 meters above the ground over the cooking center. However, the disadvantage of this situation lies therein that the vapor exhaust hood has to have a high suction power capacity that is great enough to adequately suction off the cooking fumes generated by the preparations cooking and to release adequately filtered air back into the cooking environment through an outlet. Another disadvantage is that the in part cancer-causing cooking fumes can be inhaled by a cook working in the cooking center prior to being suctioned off into the vapor exhaust hood and therefore the vapor exhaust hoods known from the prior art have not succeeded in achieving any effective protection against health hazards.

The objective of the invention is to design a vapor exhaust hood of the type indicated in the precharacterizing clause of patent claim 1 in such a way that exposure to health hazards can be safely avoided for the cook.

The vapor exhaust hood in accordance with the invention is

preferably not stationary and designed to be site displaceable, and can be positioned at a low height over any desired cooking site of a cooking center. By "low height" we mean directly over the cooking site, or therefore far below the height at which the cook's nose is normally located. In this manner, the vapor exhaust hood can be brought directly over the cooking preparations, and the fumes emanating from the latter can be suctioned off in a simple manner from the area in which the cook is working by means of the vapor exhaust hood before the cook can inhale the health compromising cooking fumes. Another advantage of the vapor exhaust hood according to the invention consists therein that it can be purposefully positioned over the cooking site in use when needed and otherwise simply be removed from the area where the cook is working.

The vapor exhaust hood according to the invention advantageously exhibits a better level of efficiency than offered by the solutions known from the prior art. Lesser quantities of air need to be freed from the cooking fumes since the vapor exhaust hood according to the invention is able to suction off the air directly, or therefore punctually, over the cooking site instead of over the entire breadth of the cooking center.

Based on this performance capability, there is also the possibility of grilling or even simmering foods while avoiding endangering the cook's health.

Advantageous embodiments of the invention make up the subject matter of the subclaims.

The vapor exhaust hood is or can be advantageously adapted to the size of the cooking site, whereby cooking center sections of variable sizes can be covered over by the vapor exhaust hood.

By means of a suspension device over the cooking site, the vapor exhaust hood can be brought, in each case, into a position that is advantageous for the cook. In an advantageous embodiment, the suspension device can be designed as a swivel and sliding support so that the vapor exhaust hood can be arranged to horizontally sweep over the cooking site. The possibility is thereby provided, on the one hand, of positioning the vapor exhaust hood directly over the cooking site or cooking preparations when needed, and, on the other hand, when there is no need for extracting cooking fumes, said hood can be moved away from the cooking site and be swung out of the working area of the cook. Furthermore, the vapor exhaust hood can be moved to slide on a plane that is parallel to the cooking sites and be positioned over several cooking sites of the cooking center that are configured next to one another.

In another advantageous embodiment of the suspension device, it can be provided that the suspension device is height adjustable so that the vapor exhaust hood can be brought down to different height levels over the cooking site.

In an advantageous embodiment of the invention, the vapor exhaust hood is provided with an air outlet which is connected to an adjunct unit in which the combination ventilator and filter system is housed. Then, the possibility is provided of carrying the cooking fumes and air charged with aerosols in their non-purified state away from the cooking site and of filtering them in the filtering system within the adjunct unit that is spatially separate from the vapor exhaust hood. In this simple mode and manner, it can be avoided that the cook and persons partaking in the meals in business cafeterias have to inhale cooking fumes. Another advantage consists therein that the vapor exhaust hood can be designed as smaller and lighter in weight since it is merely assuming the function of being an enlarged admission opening for the cooking vapors that are to be extracted. Beyond this, another advantage consists in that the filtering system in the separate adjunct unit is especially easy to maintain and clean.

For carrying away the cooking fumes, the connection between the vapor exhaust hood and the adjunct unit can be comprised of an air duct approximating a tubular form which, in an advantageous form of embodiment, is designed to be flexible, self-supporting and a support for the vapor exhaust hood. With this, the vapor exhaust hood remains, as always, site displaceable and freely placeable in the room and can be positioned over any desired cooking site. In another advantageous embodiment of the invention, the air duct can be held up by a support fixture connected to the adjunct unit. This represents a cost-efficient solution of the invention since standard products that are known in the trade can be used for the air duct .

The support fixture can advantageously be comprised of a support that is arranged perpendicular to the adjunct unit which carries a pivoting and/or sliding crossbar, whereby the crossbar has a counterweight on the one side, and a suspender sliding along the crossbar on which the air duct is suspended together with the vapor exhaust hood and can be displaced in three planes or x, y, z directions. This ensures that the vapor exhaust hood can be brought into any desired position over the cooking center. When the support is rotatably connected to the adjunct unit, greater flexibility and mobility are provided for the vapor exhaust hood. The vapor exhaust hood can also be brought into the desired position by pushing the adjunct unit over to a given cooking site. To this end, it is therefore purposeful to equip the adjunct unit with wheels.

When the combination ventilator and filtering system is housed in the vapor exhaust hood, the cooking fumes can already be purified in the vapor exhaust hood and subsequently released into the direct environment of the cooking center without causing any offensive odors for the persons partaking in the meals or without compromising or endangering the health of the cook. The design of the filtering system according to the invention with a CNS rotational flow filter and a zeolite odor filter proves to be especially advantageous for this constructive form of embodiment of the vapor exhaust hood since both of these filtering systems are especially efficient in performance and can be provided with smaller dimensions than other filters known from the prior art.

A simple and functional form of embodiment of the vapor exhaust hood exhibits an accordion-like design of the air duct segment opposite the vapor exhaust hood. Upon relocating the vapor exhaust hood away from the cooking site, the excess length in air duct can be collapsed together so as to become a space saver.

In an especially advantageous form of embodiment of the vapor exhaust hood, it is provided with several folding hood elements whose size can be additionally changed in terms of surface area. Thus, the surface of the cooking center to be covered can be accommodated by the vapor exhaust hood according to need and be adjusted by a person using the system.

The hood elements can be made of a transparent material, preferably of glass, so as not to impair the cook's field of vision and work. In an advantageous manner, cooking can also be performed without obstructing the view for a guest, so that in a type of spectator kitchen, demonstrations of fresh food preparations can possibly be conducted to promote sales.

The vapor exhaust hood according to the invention can be designed as a part of a larger vapor exhaust unit covering, for example, the entire cooking center, whereby the vapor exhaust hood is connected to the ventilator and filtering system of the vapor exhaust

unit. The resulting advantage is that the vapor exhaust hood only needs to be positioned over the specific section of the cooking center from which the noxious cooking fumes are emanating and the cooking vapors can be suctioned off directly at their point of origin.

The vapor exhaust hood according to the invention makes it possible to have an especially high degree of variability and flexibility in the layout of cooking centers and food service counters.

In the following, forms of embodiment of the invention shall be described in terms of their underlying principles by way of drawings.

Shown in:

Figure 1: a three dimensional view of a first form of embodiment of a vapor exhaust hood according to the invention, which is arranged over a cooking center and is connected to an adjunct unit,

Figure 2: the adjunct unit as per **figure 1** in a cross section view,

Figure 3: the adjunct unit as per **figure 1** in a longitudinal cross section view,

Figure 4: as a detail from a top view of the hood elements of the vapor exhaust hood from the first form of embodiment,

Figure 5: a second form of embodiment of the vapor exhaust hood according to the invention, which is provided with a suspending device,

Figure 6: a third form of embodiment of the vapor exhaust hood according to the invention, which is provided with another suspending device, different from the one in figure 5, and

Figure 7: a fourth form of embodiment of the vapor exhaust hood according to the invention, which is designed as a part of a larger stationary vapor exhaust unit.

In **figure 1** is represented a first form of embodiment of a vapor exhaust hood **1** which is positioned over a cooking center **2** and which, via an air duct **3**, stands connected to an adjunct unit **4** in which here, in the case of a first form of embodiment, is housed a combination ventilator and filtering system **12**. In the present form of embodiment, the air duct **3** is designed as a bendable, flexible hose which is held up by a support fixture **5** from the adjunct unit **4**. The support fixture **5** comprises a support **6**, arranged at a right angle to the adjunct unit **4**, which carries a pivoting and/or sliding crossbar **7**. The crossbar **7** is provided with a counterweight **8** and with a suspender **9** which can slide along the crossbar **7** and on which the air duct **3** is suspended with the vapor exhaust hood **1** and can slide. With this constructive form of embodiment, the vapor exhaust hood **1** can be displaced and arranged in the three planes x, y, z, as indicated by the arrows represented in **figure 1**, to any desired position over the cooking site **10** in the cooking center **2**.

The suspender **9** is securely connected to the air duct **3** and, upon positioning of the vapor exhaust hood **1**, slides along from the crossbar **7**, said suspender **9** being looped around like a noose. The support **6** is pivotably connected to the adjunct unit **4** so that the air duct **3**, together with the vapor exhaust hood **1**, is pivotable versus the adjunct unit **4**. The air duct **3** exhibits in its segment **29** opposite the vapor exhaust hood **1** an accordion-like hose.

The adjunct unit **4** is provided with wheels **11**. This makes it possible to push the adjunct unit **4** from one cooking center **2** to the next or to also bring the vapor exhaust hood **1** into a desired position over the cooking site **10** by pushing the adjunct unit **4**.

In **figures 2** and **3**, the adjunct unit **4** is represented in cross section or in longitudinal cross section view. The adjunct unit **4** houses the ventilator and filtering system **12** and has an inlet **13** and

an outlet **14**. The air suctioned off by the vapor exhaust hood **1** is led through the air duct **3** and the inlet **13** to the interior of the adjunct unit **4**. There, it is channeled through a CNS rotational flow filter **15** and a zeolite odor filter **16** and then released into the surroundings through the outlet **14**. The suction action is generated in the adjunct unit **4** in accordance with **figures** 2 and 3 by means of a fan **17** which is directly arranged at the outlet **14** of the adjunct unit **4**.

In **figure 4**, the vapor exhaust hood **1** is represented in a top view. The vapor exhaust hood **1** exhibits a frame **18** on which four hood elements **19** are secured to flap/hinge. The hood elements **19** are made of a transparent material so as to not obstruct the cook's view of the meal he is to prepare. In the present form of embodiment, the hood elements **19** are made of glass. Of course, it is left to the discretion of the person skilled in the art to manufacture the hood elements **19** from another suitable material such as, for example, from a transparent plastic.

In **figures** 5 - 7, three more forms of embodiment of the vapor exhaust hood **1** are represented.

According to **figure** 5 as the second form of embodiment, the vapor exhaust hood **1** is designed as an air recirculating hood which purifies the air suctioned in by means of a combination ventilator and filtering system, not shown here since configured on the interior of the vapor exhaust hood **1**, and which then channels the air back out into the surroundings via an air outlet **28**. In order that the vapor exhaust hood **1** may be positioned above the cooking center **2** by a simple mode and manner, the vapor exhaust hood **1** hangs by a suspension device **20**. The suspension device **20** represented in **figure** 5 is comprised of a cable **21** as the ones known from the prior art used in lamp systems that are height adjustable, and of a rewinding device arranged on the inside of the vapor exhaust hood **1** and not shown in detail here. The cable **21** is connected to a rod **22** which is mounted inside of a track **23** on each of its ends. Based on the suspension device **20**, it is possible to slide the vapor exhaust hood **1** in three planes, x, y or z and to position it in the desired location above a cooking center.

According to **figure** 6 as the third form of embodiment, the vapor exhaust hood **1** is pivotably connected to a rod **31** by means of a combination pivoting and sliding bearing **24**. By means of the pivoting and sliding bearing **24**, the vapor exhaust hood **1** can therefore be pivoted from a plane that is more or less horizontal to the plane of a cooking site, not represented here, to a plane that is more or less at a right angle to the plane of the cooking site. Furthermore, the vapor exhaust hood **1** can slide along the rod **31** in either direction of a double arrow designated by "x". The rod **31** is guided in tracks **33** in the area around its ends so that the vapor exhaust hood **1** can be moved in a vertical direction away from or toward the cooking site. The pivoting and sliding bearing **24** and the guidance of the rod **31** in the tracks **33** are designed in such a manner that the vapor exhaust hood **1** can simply be moved by a cook or by another service person, whereby the arrangement is selected such that a movement of the vapor exhaust hood does not ensue without the physical action from an operator.

In the form of embodiment according to **figure** 6, the hood elements **19** are each comprised of two parts which are connected to one another by two hinges **25a**. Furthermore, the hood elements **19** are each connected to an upper frame of the vapor exhaust hood by two

hinges **25b**. Owing to the hinges **25a**, the area of the cooking center **2** covered by the vapor exhaust hood **1** can be adjusted to meet the needs of the individual situation. A cook can also acquire a direct view over the cooking site by folding up the hood elements **19** by means of the hinges **25b**, for example, when the hood elements **19** become fogged up due to steam buildup or if the cook needs more space to work. Owing to the folding hood elements **19**, the surface size of the vapor exhaust hood **1** and its working range can be changed.

According to **figure** 7 as the fourth form of embodiment, the vapor exhaust hood **1** is designed as a part of a larger vapor exhaust unit **26** covering the entire cooking center **2**. The vapor exhaust hood **1** can be pulled out from the vapor exhaust unit **26** by the cook, if need be, and positioned directly over the cooking site **10** so that the cooking fumes emanating from a cooking preparation located at the cooking site **10** can be suctioned off by the vapor exhaust hood **1** and channeled through the air duct **3** to the ventilator and filtering system of the vapor exhaust unit **26**. The vapor exhaust hood **1** is connected to a rod **37** via two cables **35, 36** each exhibiting a winding unit **27**. With its ends, the rod **37** is in turn guided in tracks **38, 39** which are configured on the inside of the vapor exhaust unit **26**.

In the fourth form of embodiment, and in deviation from the represented example, the vapor exhaust hood **1** can exhibit its own ventilator and filtering system so that a connection to the ventilator and filtering system of the vapor exhaust unit **26**, as in **figure 7**, is not required.

In another form of embodiment of the vapor exhaust hood deviating from the exemplary embodiments represented, the suspension can be designed to be pneumatic and/or hydraulic (not represented).

Patent Claims

1. Vapor exhaust hood with a subordinated combination ventilator and filtering system, **thus characterized**, that the vapor exhaust hood (1) is designed to be height-adjustable in such a way that it can be positioned over any desired cooking site (10) of a cooking center (2), cooking range or such similar, at a low height.
2. Vapor exhaust hood according to claim 1, thus characterized, that in its size, the vapor exhaust hood (1) is at least approximately adapted or adaptable to the size of the cooking site (10).
3. Vapor exhaust hood according to claim 1 or 2, thus characterized that it can be positioned over the cooking site (10) by means of a suspension device (20).
4. Vapor exhaust hood according to claim 3, thus characterized that the suspension device (20) exhibits a pivoting and sliding bearing (24) so that the vapor exhaust hood (1) can be moved around opposite the cooking site (10).
5. Vapor exhaust hood according to claim 3 or 4, thus characterized that the suspension device (20) is adjustable in height.
6. Vapor exhaust hood according to one of the claims 1 through 5, thus characterized that the vapor exhaust hood (1) has an air outlet (28).
7. Vapor exhaust hood according to one of the claims 1 through 6, thus characterized that the combination ventilator and filtering system comprise one construction unit together with the vapor exhaust hood (1).
8. Vapor exhaust hood according to claim 7, thus characterized

that the combination ventilator and filtering system (12) is housed in the vapor exhaust hood (1).

9. Vapor exhaust hood according to claim 6, thus characterized that the air outlet (28) of the vapor exhaust hood (1) stands connected to the adjunct unit (4) in which the combination ventilator and filtering system (12) is arranged.

10. Vapor exhaust hood according to claim 9, thus characterized that the connection between the vapor exhaust hood (1) and the adjunct unit (4) exhibits at least an approximately tubular shaped air duct (3).

11. Vapor exhaust hood according to claim 10, thus characterized that the air duct (3) is designed to be inherently bendable and self-supporting and serves as the support for the vapor exhaust hood (1).

12. Vapor exhaust hood according to claim 10 or 11, thus characterized that the adjunct unit (4) exhibits a support fixture (5) for the air duct (3).

13. Vapor exhaust hood according to claim 12, thus characterized that the support fixture (5) comprises a support (6) arranged at a right angle to the adjunct unit (4), said support bearing a pivoting and/or sliding crossbar (7), whereby, on the one side, the crossbar (7) has a counterweight (8) and on the other side, sliding along with the crossbar (7), has a suspender (9) by which the air duct (3) is suspended, together with the vapor exhaust hood (1), and can slide.

14. Vapor exhaust hood according to claim 13, thus characterized that the crossbar (7) has a suspender (9) that slides along the crossbar (7), by which suspender (9) the air duct (3) is suspended with the vapor exhaust hood (1) and said air duct can slide in three directions (x, y, z).

15. Vapor exhaust hood according to claim 13 or 14, thus characterized that the support (6) is connected with the adjunct unit (4) to rotate.

16. Vapor exhaust hood according to one of the claims 9 through 15, thus characterized that the vapor exhaust hood can be brought into position over the cooking site (10) by moving the adjunct unit (4).

17. Vapor exhaust hood according to one of the claims 10 through 16, thus characterized that a segment (29) of the air duct (3) opposite the vapor exhaust hood (1) is designed like an accordion.

18. Vapor exhaust hood according to one of the claims 1through 17, thus characterized that the vapor exhaust hood (1) exhibits several hood elements (19) designed to fold.

19. Vapor exhaust hood according to claim 18, thus characterized that the hood elements (19) can be changed in terms of the size of their surface.

20. Vapor exhaust hood according to claim 18 or 19, thus characterized that the hood elements (19) are made of a transparent material, preferably of glass.

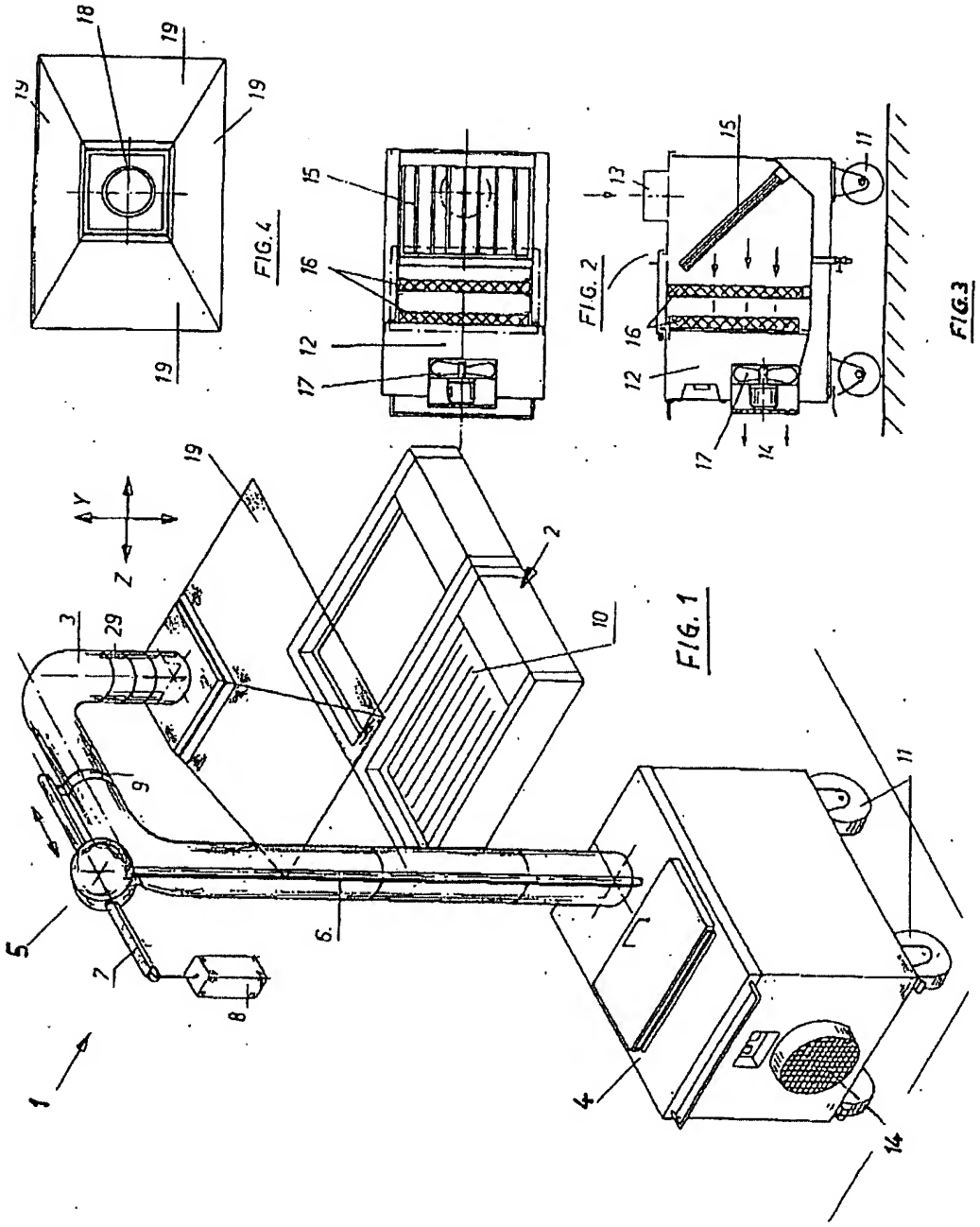
21. Vapor exhaust hood according to one of the claims 1through 20, thus characterized that the combination ventilator and filtering system (12) is comprised of a CNS rotational flow filter (15) and of a zeolite odor filter (16).

22. Vapor exhaust hood according to one of the claims 9 through 21, thus characterized that the adjunct unit (4) is conveyable on wheels (11).

23. Vapor exhaust hood according to one of the claims 1through 22, thus characterized that it is designed as a part of a larger, stationary vapor exhaust unit (26) and can be connected to the combination ventilator and filtering system of said unit.

Hereby appended, 3 pages of drawings

Number: **DE 198 10 818 A1**
Int. Class.[6]: **F 24 C 15/20**
Publication date: September 16, 1999



Number: **DE 198 10 818 A1**
Int. Class.[6]: **F 24 C 15/20**
Publication date: September 16, 1999

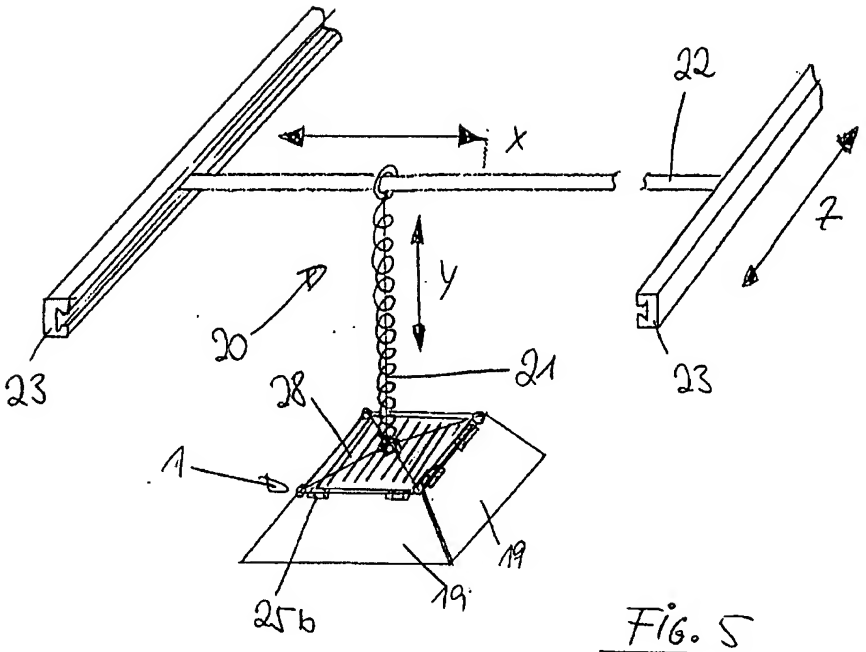


FIG. 5

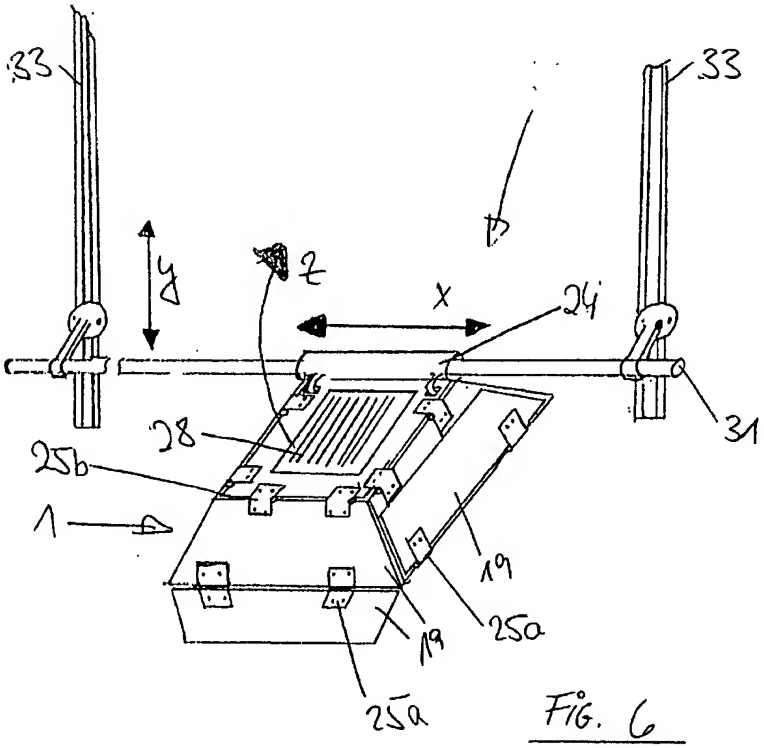


FIG. 6

Number: **DE 198 10 818 A1**
Int. Class.[6]: **F 24 C 15/20**
Publication date: September 16, 1999

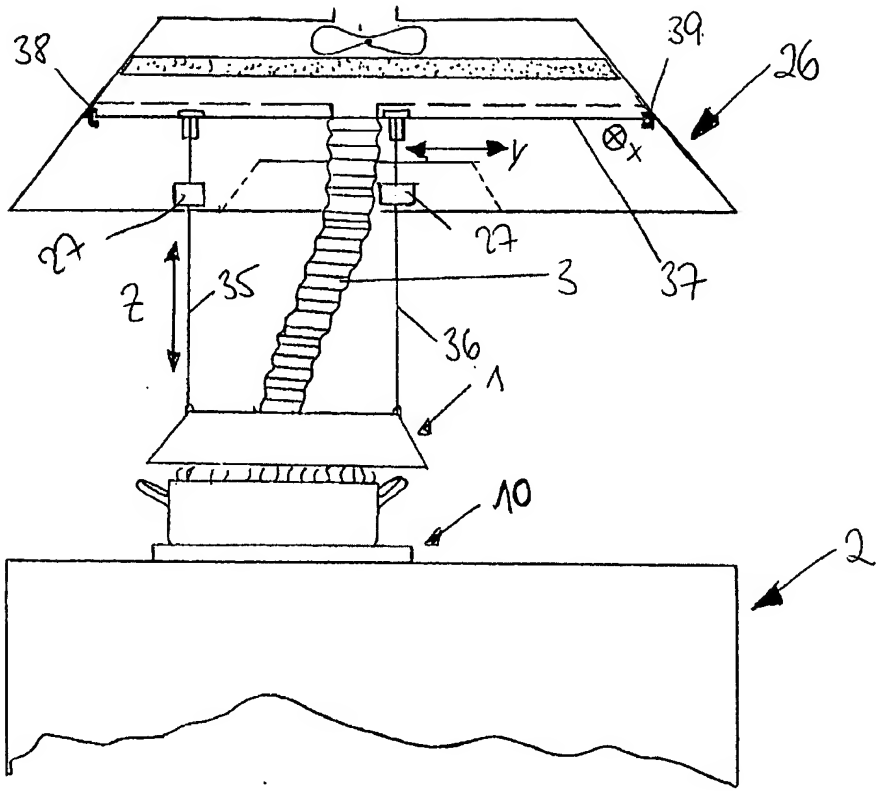


Fig. 7

[redacted] [redacted] 

Morningside | Translations

TRANSLATOR CERTIFICATION

I, Patricia Merkel Meyers, a translator fluent in the German language, on behalf of Morningside Evaluations and Consulting, do solemnly and sincerely declare that the following is, to the best of my knowledge and belief, a true and correct translation of the document(s) listed below in a form that best reflects the intention and meaning of the original text.

MORNINGSIDE EVALUATIONS AND CONSULTING

Patricia Merkel-Meyers
Signature of Translator

Date: May 31, 2005

Description of Documents Translated: Vapor exhaust hood

450 7th Ave | 6th Floor | New York, NY 10123 | Tel 212.643.8800 | Fax 212.643.0005 | www.mside.com